IN THE CLAIMS

Amend the claims as follows:

1-27. (canceled).

28. (currently amended) A system for evaluating heart failure within a patient using an implantable medical device, comprising:

a ventricular end-diastolic volume (EDV) detection unit for detecting values representative of ventricular EDV; and

a ventricular EDV-based heart failure evaluation unit operative to detect the progression of heart failure within the patient based on changes in ventricular EDV;

wherein the system is coupled to at least two electrodes for implant within a patient's ventricles and wherein the EDV detection unit is adapted to:

identify a baseline point in time within each of a plurality of cardiac cycles for detecting the values representative of ventricular EDV;

detect a signal representative of the impedance between the two ventricular electrodes at each baseline point in time; and

determine a baseline ventricular EDV value based on the impedance signal detected at each baseline point in time; and

wherein the baseline point in time within each of the plurality of cardiac cycles ~~within a cardiac cycle~~ is identified by tracking a pre-ejection interval and then selecting a point in time within the pre-ejection interval.

29. (original) The system of claim 28 and further comprising:

a heart failure therapy controller that is responsive to detection of a progression of heart failure by the heart failure evaluation unit to adjust one or more operating parameters.

30. (original) The system of claim 28 and further comprising:

an implantable drug pump in communication with the heart failure evaluation unit and responsive to detection of a progression of heart failure by the heart failure evaluation unit to administer a drug.

31. (original) The system of claim 28 and further comprising:

an implantable heart failure warning device in communication with the heart failure evaluation unit and responsive to detection of a progression of heart failure by the heart failure evaluation unit to generate a warning.

32. (currently amended) A system for detecting the progression of heart failure within a patient using an implantable medical device, comprising:

means for determining ventricular end-diastolic volume (EDV) values; and

means for tracking the progression of heart failure, if any, within the patient based on the values representative of ventricular EDV;

wherein the means for determining ventricular EDV values comprises:

means for identifying a baseline point in time within each of a plurality of cardiac cycles for detecting the values representative of ventricular EDV;

means for detecting a signal representative of the impedance between the two ventricular electrodes at each baseline point in time; and

means for determining the baseline ventricular EDV values based on the impedance signal detected at each baseline point in time; and

wherein the baseline point <u>in time within each of the plurality of cardiac cycles</u> ~~within a cardiac cycle~~ is identified by tracking a pre-ejection interval and then selecting a point <u>in time</u> within the pre-ejection interval.

33. (original) The system of claim 32 and further comprising:

means for controlling delivery of therapy based on progression of heart failure.

34. (original) The system of claim 32 and further comprising:
means for administering a drug based on progression of heart failure.

35. (original) The system of claim 32 and further comprising:
means for generating a warning based on progression of heart failure.

36. (new) The system of claim 28 wherein the EDV detection unit is adapted to detect the values representative of ventricular EDV during a ventricular pacing pulse.

37. (new) The system of claim 28 wherein the heart failure evaluation unit is further adapted to detect heart failure by comparing the values representative of the ventricular EDV of the patient against a threshold ventricular EDV value indicative of heart failure.

38. (new) The system of claim 28 wherein the heart failure evaluation unit is further adapted to evaluate the severity in heart failure, if present, within the patient based on the values representative of ventricular EDV.

39. (new) The system of claim 38 wherein the heart failure evaluation unit is adapted to evaluate the severity in heart failure by comparing the values representative of the ventricular EDV of the patient against various threshold ventricular EDV values indicative of various degrees of heart failure.

40. (new) The system of claim 28 wherein the heart failure evaluation unit is further adapted to detect changes in heart failure within the patient based on changes, if any, over time in the values representative of ventricular EDV.

41. (new) The system of claim 40 wherein the heart failure evaluation unit is further adapted to detect changes in heart failure by comparing values representative of ventricular EDV detected over an extended period of time.

42. (new) The system of claim 41 wherein the heart failure evaluation unit is adapted to compare values representative of ventricular EDV detected over a period of at least one month.

43. (new) The system of claim 28 wherein the EDV detection unit is adapted to detect values representative of ventricular EDV by:

tracking at least one respiration cycle;

detecting values representative of ventricular EDV at like baseline points within a plurality of cardiac cycles during the respiration cycle; and

processing the values representative of ventricular EDV over at least one respiration cycle to generate an average ventricular EDV value.

44. (new) The system of claim 43 wherein the EDV detection unit is adapted to process the values by averaging the values.

45. (new) The system of claim 43 wherein the EDV detection unit is further adapted to average the values over many cardiac cycles to reduce respiratory variation of the EDV value.

46. (new) The system of claim 28 wherein the EDV detection unit is adapted to detect a signal representative of impedance by delivering a detection pulse to the ventricles using the ventricular electrodes at the baseline point and sensing ventricular impedance based on the detection pulse using the ventricular electrodes.

47. (new) The system of claim 46 wherein the EDV detection unit is adapted to select an amplitude of the detection pulse to be sufficiently low to avoid triggering myocardial depolarization.

48. (new) The system of claim 28 wherein the EDV detection unit is adapted to track the pre-ejection interval by:

identifying a ventricular depolarization event; and

identifying a window 10 - 50 milliseconds (msecs) following the ventricular depolarization event.

49. (new) The system of claim 28 wherein the EDV detection unit is additionally adapted to detect values representative of passive filling volume by:

identifying a baseline point within a cardiac cycle for detecting the value representative of passive filling volume;

detecting a signal representative of the impedance between the two ventricular electrodes at each baseline point in time; and

determining a baseline passive filling volume value based on the impedance signal detected at each baseline point in time.

50. (new) The system of claim 49 wherein the EDV detection unit is adapted to identify the baseline point within the cardiac cycle for detecting the value representative of passive filling volume by:

tracking atrial depolarization to ventricular depolarization intervals during cardiac cycles;

predicting a next expected atrial depolarization based upon the atrial depolarization to ventricular depolarization intervals; and

identifying a window 10 - 50 milliseconds (msecs) prior to a next expected atrial depolarization.

51. (new) The system of claim 50 wherein the EDV detection unit is adapted to identify the baseline point within the cardiac cycle for detecting the value representative of passive filling volume by identifying the time for delivery of a ventricular pacing pulse.

52. (new) The system of claim 51 wherein the EDV detection unit is adapted to detect the signal representative of the impedance by:

delivering the ventricular pacing pulse using the ventricular electrodes; and

sensing ventricular impedance based upon the ventricular pacing pulse using the ventricular electrodes.

53. (new) The system of claim 29 wherein the heart failure therapy controller delivering therapy is further adapted to deliver cardiac resynchronization therapy (CRT) to the heart of the patient.